

Serial No. 09/074,472

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: RICHTER, Mark M. *et al.*

Serial No: 09/074,472

Filed: May 7, 1998

For: ASSAYS EMPLOYING  
ELECTROCHEMILUMINESCENT LABELS  
AND ELECTROCHEMILUMINESCENCE  
QUENCHERS

Art Unit: 1655

Examiner: Arun Chakrabarti, Ph.D.

RESPONSE UNDER 37 CFR §1.116

Assistant Commissioner for Patents  
Box AF  
Washington, DC 20231

April 12, 2001

Dear Sir:

This reply is in response to the Final Rejection dated January 18, 2001 which has a shortened statutory period for response of three months that expires on April 18, 2001.

AMENDMENT

Please amend the above-identified patent application as shown below.

Do not  
Enter 5-19-01  
A. Chakrabarti  
A/23/01

In the Claims:

Please cancel claims 1-23 and 25-27 without prejudice.

Please add the following new claims:

28. A method for qualitative or quantitative electrochemiluminescence (ECL) detection of an analyte in a sample, said analyte selected from the group consisting of oligonucleotides, DNA, RNA, polypeptides, antibodies, antigens, enzymes, enzyme substrates and polysaccharides, said method comprising the steps of:
- (a) preparing an assay mixture comprising
    - said sample,
    - a reagent comprising an ECL label selected from the group consisting of ruthenium, osmium and polyaromatic hydrocarbons, and
    - a reagent comprising an ECL quenching moiety, said ECL quenching moiety selected from the group consisting of phenol moieties, quinone moieties, benzene carboxylic acid moieties, and benzene carboxylate moieties;
  - (b) determining any difference between the ECL emissions of
    - (i) the assay mixture prepared in step (a) and
    - (ii) an assay mixture comprising
      - said reagent comprising an ECL label,
      - said reagent comprising an ECL quenching moiety, and

a known amount of said analyte; and

- (c) correlating any difference determined in step (b) with the amount of analyte in said sample.

29. An assay reagent kit for qualitative or quantitative electrochemiluminescence (ECL) detection of an analyte in a sample, said analyte selected from the group consisting of oligonucleotides, DNA, RNA, polypeptides, antibodies, antigens, enzymes, enzyme substrates and polysaccharides, said assay reagent kit comprising:

- (a) a reagent comprising an ECL label selected from the group consisting of ruthenium, osmium and polyaromatic hydrocarbons, and
- (b) a reagent comprising an ECL quenching moiety, said ECL quenching moiety selected from the group consisting of phenol moieties, quinone moieties, benzene carboxylic acid moieties, and benzene carboxylate moieties.

#### REMARKS

In view of the the comments which follow, and pursuant to 37 CFR §1.116, entry of the above amendment and reconsideration of the Final Rejection of January 18, 2001 is respectfully requested by Applicants.

In an effort to promote prosecution, Applicants have rewritten and condensed the previously pending claims set by incorporating limitations of the dependent claims into the independent claims. Following entry of the present amendment, two claims remain for consideration by the examiner.

New claim 28 is a method claim corresponding to twice-amended claim 1 and reciting the quenching moiety limitations previously recited in claims 2-6, the ECL label

limitations previously recited in claims 7-9, and the analyte limitations previously recited in claims 10-18. No new matter has been added.

New claim 29 is a reagent kit claim corresponding to amended claim 27 and reciting the quenching moiety limitations previously recited in claims 2-6, the ECL label limitations previously recited in claims 7-9, and the analyte limitations previously recited in claims 10-18. No new matter has been added.

Rejections under 35 USC §112, first paragraph

Claims 1-23 and 25-27 have been rejected under 35 USC §112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention.

Claims 1 and 25 have been rejected over the recitation of the negative limitations “wherein said ECL label and said analyte are not identical” and “wherein said ECL quenching moiety and said ECL label are not identical” in claims 1 and 25 respectively.

In new claims 28 and 29, the negative limitations referred to above are now eliminated, and limitations of the ECL label, analyte and ECL quenching moiety are recited in positive terms. The rejection has been overcome, and the examiner’s consideration of the two new claims is respectfully requested.

Rejections under 35 USC §103 (a)

Claims 1-6, 9, 19-21 and 24-27 have been rejected under 35 USC §103 (a) as being unpatentable over Aizawa *et al.*, *Proceedings Electrochemical Society* 93-97, 662-673, 1993 (hereinafter “Aizawa”) in view of US Patent 5,925,517 issued July 20, 1999 to Tyagi *et al.* (hereinafter “Tyagi”).

Aizawa teaches an electrochemiluminescence method for detecting an analyte (human IgG antigen) in a sample comprising the steps of preparing an assay mixture comprising the sample, a reagent having an ECL label (IgG antibody-bound luminol) and determining ECL emission of the assay mixture following immunocomplexation. Aizawa does not teach an ECL quenching moiety selected from the group consisting of phenol moieties, quinone moieties, benzene carboxylic acid moieties, and benzene carboxylate moieties.

Tyagi describes hybridization assays in which a target nucleic acid sequence is hybridized to a complementary probe sequence. The probe is characterized by “arms” which are members of an affinity pair, especially a fluorophore and a corresponding quencher. The examiner argues that Tyagi teaches a quenching moiety comprising a phenol moiety, a benzene carboxylic acid moiety or a benzene carboxylate moiety.

Applicants argue that the examiner’s case for *prima facie* obviousness has not been made. Tyagi teaches fluorescence quenchers, not electrochemiluminescence quenchers, and the use of fluorophore/quencher pairs in fluorescence resonance energy transfer (FRET) methods. The combination of Aizawa and Tyagi do not produce Applicants invention of a method or test kit for electrochemiluminescent detection of an analyte using an ECL label and an ECL quenching moiety.

The examiner’s consideration of the claims now rewritten as claims 28 and 29 in light of the above remarks is respectfully requested by Applicants.

Claims 1, 2, 4, 9, 19-21 and 24-27 have been rejected under 35 USC §103 (a) as being unpatentable over Aizawa in view of Tyagi and further in view of Stratagene Catalog, p. 39, 1988 (hereinafter “Stratagene”).

Aizawa and Tyagi teach as described above. The examiner argues that Stratagene teaches a motivation to combine reagents into kit format.

Applicants argue that even the combination of all three references still do not make the claimed invention and that the examiner's case of *prima facie* obviousness has not been made. None of the references teaches the use of an ECL quencher in an electrochemiluminescence assay for an analyte. The examiner's consideration of the claims now rewritten as claims 28 and 29 in light of the above remarks is respectfully requested by Applicants.

\* \* \* \* \*

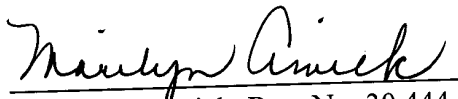
Applicants submit that their application is now in condition for allowance, and entry of the present amendment and favorable reconsideration of their application in light of the above remarks is respectfully requested. Allowance of claims 28-29 at an early date is earnestly solicited.

Applicants acknowledge that entry of the present amendment following final rejection is at the examiner's discretion. If the examiner chooses not to enter the present amendment, Applicants request that the examiner please issue an Advisory Action, following which Applicants will file a Request for Continued Examination.

The Examiner is hereby authorized to charge any fees associated with this amendment to Deposit Account No. 02-2958. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

Date: \_\_\_\_\_ April 12, 2001 \_\_\_\_\_



Marilyn L. Amick, Reg. No. 30,444  
Roche Diagnostics Corporation  
9115 Hague Road  
Indianapolis, IN 46250-0457  
Phone: 317-521-7561  
Fax: 317-521-2883